1403 #23 9-5-02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of Atty. Docket

DANIELE BAGNI ET AL PHN 16,762A

Serial No.: 09/192,674 Group Art Unit: 2624

Filed: NOVEMBER 16, 1998 Examiner: W. CHEN

Title: MOTION-COMPRESSED PREDICTIVE IMAGE ENCODING AND DECODING

Commissioner for Patents
Washington, D.C. 20231

APPEAL BRIEF

Sir:

The rejection of Claims 1-9 is being appealed, which are reproduced in the attached Appendix.

1. Real Party in Interest

The real party in interest is U. S. Philips Corporation, the assignee herein.

2. Related Appeals and Interferences

The Appellant is not aware of any appeals or interferences that relate to the present application.

3. Status of all Claims

Claims 1-9 were submitted in the original application when filed. Claims 1-9 were finally rejected in the Office Action dated March 19, 2002.

4. Status of Amendment

No Amendments were filed subsequent to the Final Rejection of March 19, 2002.

5. Summary of the Invention

The present invention is directed to a method and apparatus for motion-compensated predictive image encoding. As can be seen from Figures 2, the present invention includes first motion vectors (MVc, *MV1*, MVr, MVa, MVb) that are estimated for first objects (16*16), as described on page 3. As further described on page 4, every occurrence of said first motion vectors (MVc, *MV1*, MVr, MVa, MVb) are filtered to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8). The second objects (8*8) are smaller than the first objects (16*16).

As further described on page 3, prediction errors are generated in dependence on the second motion vectors (MV1, MV2, MV3, MV4) only. As can be seen from Figure 1, the first motion vectors (MVc, MV1, MVr, MVa, MVb) are then combined with the prediction errors.

6. Issues Presented for Review

The issue on review is whether under 35 USC 103 Claims 1-9 are unpatentable over Ng (U.S. Patent 5,146,325) in view of de Haan et al. (True-Motion Estimation with 3-D Recursive Search Block

Matching).

7. Grouping of the Claims

The Appellant respectfully submits that Claims 1-9 either stand or fall together.

8. Arguments

Claims 1-9 stand finally rejected under 35 USC 103 as being unpatentable over Ng (U.S. Patent 5,146,325) in view of de Haan et al. (True-Motion Estimation with 3-D Recursive Search Block Matching).

In order to make a proper obvious rejection under 35 U.S.C. 103, MPEP Section 706.02(j) requires that the prior art reference (or references when combined) must teach or suggest all of the claim limitations. Further, either the references must expressly or impliedly suggest the claimed invention. Ex parte Clap, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985)

In view of the above, it is respectfully submitted that the combination of over Ng in view of de Haan et al. neither expressly nor impliedly suggest all of the claim limitations. In particular, such features include ""filtering (MVPF) every occurrence of said first motion vectors (MVc, *MVl*, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8)".

In addressing the presently recited "filtering" in the above

rejection, section VII, pages 373-374, of de Haan et al.is being relied on. However, in page 373, right column, lines 2-9, de Haan et al. discloses:

"The block sizes commonly used in block matching are in a range that give rise to very visible artifacts...Therefore, a post operation is introduced in this section: it eliminates fixed block boundaries from the vector field without blurring contours."

Based on the above disclosure, it was evident that de Haan et al. neither teaches nor suggests the presently recited "filtering (MVPF) every occurrence of said first motion vectors (MVc, *MVl*, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8)", as required by the claims.

Despite the above point, the present rejection was made final in the Office Action dated March 19, 2002. In making this rejection final, it was stated that the method disclosed in section II of de Haan, especially the part after page 373, right column, line 9, teaches an alternative filtering process. However, after carefully reviewing this portion of de Haan et al., the Applicant still does not see what this has to do with the presently recited "filtering".

On page 373, right column, starting from line 9, de Haan et al. discloses an option is found that prevents vectors that did not result from the estimation from being generated. Further, in lines 7-8, de Haan et al. make it clear that the filtering only

eliminates block boundaries from the vector field without blurring contours.

Based on the above disclosure, it is evident that de Haan et al. neither teaches nor suggests the presently recited "filtering (MVPF) every occurrence of said first motion vectors (MVc, *MVl*, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8)", as required by the claims. Therefore, it is respectfully submitted that this feature is distinguishable over Ng in view of de Haan et al.

It is also respectfully submitted that the combination of Ng in view of de Haan et al. also neither expressly nor impliedly suggest "generating prediction errors in dependence on said second motion vectors only", as further required by the claims. In initially addressing this feature in the above rejection, column 2, first paragraph of section VII, of de Haan et al. was being relied on.

However, in reviewing the first paragraph of section VII of Haan et al., nothing at all was disclosed in regard to "generating prediction errors". After the Applicant pointed this out, column 5, lines 39-64, of Ng was then relied on for this feature, as described in the Office Action dated March 19, 2002.

However, in column 5, lines 39-64, Ng only discloses that a predicted field is generated using motion vectors and data from the prior I field, and the predicted field is subtracted from the current field on a pixel by pixel basis to generate residues. Based on this disclosure, it is evident that Ng neither teaches nor

suggests the presently recited "generating prediction errors in dependence on said second motion vectors only", as required by the claims. Therefore, it is also respectfully submitted that this feature is distinguishable over Ng in view of de Haan et al.

In view of the above described distinctions, it is respectfully submitted that the invention of Claims 1-9 is not obvious over Ng in view of de Haan et al. Therefore, the Appellant respectfully requests that the final rejection of these claims be reconsidered and reversed.

Please charge the fee of $310.00 to Deposit Account No. 14-1270.

Respectfully submitted,

By _____
Russell Gross, Reg. 40,007
Attorney
(914) 333-9631
August 15, 2002

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited this date with the United States Postal Service as first-class mail in an envelope addressed to:

COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

On August 19, 2002

By _____

A P P E N D I X

1. A method of motion-compensated predictive image encoding, comprising the steps of:

estimating (ME) first motion vectors (MVc, *MV1*, MVr, MVa, MVb) for first objects (16*16);

filtering (MVPF) every occurrence of said first motion vectors (MVc, *MV1*, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8), said second objects (8*8) being smaller than said first objects (16*16);

generating (3) prediction errors in dependence on said second motion vectors (MV1, MV2, MV3, MV4)only; and

combining (VLC) said first motion vectors (MVc, MV*1*, MVr, MVa, MVb) and said prediction errors.

2. A method as claimed in claim 1, wherein said first objects (16*16) are macro-blocks, said second objects (8*8) are blocks, and said filtering step (MVPF) comprises the steps of:

providing x and y motion vector components of a given macro-block (MVc) and of macro-blocks (MV*1*, MVr, MVa, MVb) adjacent to said given macro-block (MVc); and

supplying for each block (MV1) of a number of blocks (MV1-MV4) corresponding to said given macro-block (MVc), x and y motion vector components respectively selected from said x and y motion vector components of said given macro-block (MVc) and from the x and y motion vector components of two blocks (MV*1*, MVa) adjacent to said block (MV1).

3. A device for motion-compensated predictive image encoding, comprising:

means for estimating (ME) first motion vectors (MVc, MV*l*, MVr, MVa, MVb) for first objects (16*16);

means for filtering (MVPF) every occurrence of_said first motion vectors (MVc, MV*l*, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for second objects (8*8), said second objects (8*8) being smaller than said first objects (16*16);

means for generating (3) prediction errors in dependence on said second motion vectors (MV1, MV2, MV3, MV4)only; and

means for combining (VLC) said first motion vectors (MVc, MV*l*, MVr, MVa, MVb) and said prediction errors.

4. A method of motion-compensated predictive decoding, comprising the steps of:

generating (VLC^{-1}) first motion vectors (MVc, MV*l*, MVr, MVa, MVb) and prediction errors from an input bit-stream, said first motion vectors (MVc, MV*l*, MVr, MVa, MVb) relating to first objects (16*16) and said prediction errors related to second objects (8*8) only;

filtering (MVPF) every occurrence of said first motion vectors (MVc, MV*l*, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for said second objects (8*8), said second objects (8*8) being smaller than said first objects (16*16); and

generating (15, MC) an output signal in dependence on said prediction errors and said second motion vectors (MV1, MV2, MV3,

MV4).

5. A method as claimed in claim 4, wherein said first objects (16*16) are macro-blocks, said second objects (8*8) are blocks, and said filtering step (MVPF) comprises the steps of:

providing x and y motion vector components of a given macro-block (MVc) and of macro-blocks (MV*l*, MVr, MVa, MVb) adjacent to said given macro-block (MVc); and

supplying for each block (MV1) of a number of blocks (MV1-MV4) corresponding to said given macro-block (MVc), x and y motion vector components respectively selected from said x and y motion vector components of said given macro-block (MVc) and from the x and y motion vector components of two blocks (MV*l*, MVa) adjacent to said block (MV1).

6. A device for motion-compensated predictive decoding, comprising:

means for generating (VLC^{-1}) first motion vectors (MVc, MV*l*, MVr, MVa, MVb) and prediction errors from an input bit-stream, said first motion vectors (MVc, MV*l*, MVr, MVa, MVb) relating to first objects (16*16) and said prediction errors related to second objects (8*8) only;

means for filtering (MVPF) every occurrence of said first motion vectors (MVc, MV*l*, MVr, MVa, MVb) to obtain second motion vectors (MV1, MV2, MV3, MV4) for said second objects (8*8), said second objects (8*8) being smaller than said first objects (16*16); and

means for generating (15, MC) an output signal in

dependence on said prediction errors and said second motion vectors (MV1, MV2, MV3, MV4).

7. A multi-media apparatus, comprising:

means (T) for receiving a motion-compensated predictively encoded image signal; and

a motion-compensated predictive decoding device as claimed in claim 6 for generating a decoded image signal.

8. An image signal display apparatus, comprising:

means (T) for receiving a motion-compensated predictively encoded image signal;

a motion-compensated predictive decoding device as claimed in claim 6 for generating a decoded image signal; and

means (D) for displaying said decoded image signal.

9. A method for generating a motion-compensated predictively encoded image signal, comprising:

estimating motion vectors (MVc, MV*l*, MVr, MVa, MVb) relating to first objects (16*16); and generating prediction errors relating to every occurrence of second objects (8*8), said second objects (8*8) being smaller than said first objects (16*16), wherein said prediction errors depend on motion vectors for said second objects (8*8)only.

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Enclosed is an original plus two copies of an Appeal Brief in the above-identified patent application.

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Respectfully submitted,

By _____
Russell Gross, Reg. 40,007
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